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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/885,311	06/20/2001	Bryan Patrick Livengood	LE9-99-015	4577

21972 7590 06/12/2002

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EXAMINER

RODEE, CHRISTOPHER D

ART UNIT PAPER NUMBER

1756

DATE MAILED: 06/12/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

MF-3

Office Action Summary

Application No.

09/885,311

Applicant(s)

LIVENGOOD ET AL.

Examiner

Christopher D RoDee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 23-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 and 30 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-22 and 30, drawn to a toner and toner composition, classified in class 430, subclass 108.1+.
- II. Claims 23-27, drawn to a process of producing a toner, classified in class 430, subclass 137.18.
- III. Claims 28 and 29, drawn to a random copolymer, classified in class 526, subclass 1+.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and III are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination permits any random compatibilizer having compatibility with units of (a) and (b) while the subcombination requires a specific reactivity ratio of the constituent monomers and weight percent of monomers not present in the combination. The subcombination has separate utility such as a coating for a wire or as a filler for a composition such as asphalt.

Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be

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made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made in another and materially different process such as by a limited coalescence process where the component materials are dissolved in a first solvent, the solution of dissolved polymers is dispersed in a non-compatible second solvent to form droplets of first solvent solution in the second solvent, and the dispersion is heated to a temperature so the first solvent evaporates.

Inventions II and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the product as claimed can be used in another and materially different process, such as heating the polymer to a molten temperature and drawing a wire through a bath of the molten polymer.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with John Brady on 4 June 2002 a provisional election was made with traverse to prosecute the invention of group I, claims 1-22 and 30. Affirmation of this election must be made by applicant in replying to this Office action. Claims 23-29 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Objections

Claim 12 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 12 requires "a reaction product incorporating at least one vinyl monomer", but claim 7 fails to provide basis for a vinyl monomer reactant. There are specific vinyl monomers present in claim 7 (e.g., styrene), but claim 12 appears to include a broader scope of vinyl monomer than present in claim 7.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5-8 and 30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

✓ It is unclear in claims 5 and 6 which particles are "the fines particles" because there is no fine particle recited in the base claim. This claim is also indefinite because claim 1 is directed to a toner composition and not toner particles. It is unclear how the claim limits the composition because there are not toner particles, *per se*, in the toner composition.

✓ In claims 7 and 8 it is unclear how the phrase "substitution analogs" and "substitution copolymers" limits the respective components of the Markush group. It is unclear if this limitation includes, for example, substituted styrene. These claims are also indefinite because it is unclear if the recited polymers (e.g., copolymers of styrene, polyolefins, polyamides, etc.) are

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the "reactants" as specified at the beginning of the Markush group or are the result of the reaction.

Applicants are respectfully urged to ensure that all claims dependent on claim 7 properly further limit claim 7 should any amendments be made.

Claim 30 is indefinite because the Jepson preamble is drawn to a toner composition but the improvement is stated as being drawn to a method. The claim improperly mixes two categories of invention and it is unclear if applicants are claimed the composition or a method. Claim 30 is also indefinite because it is unclear what the basis for the molecular weight measurement is. Different bases (e.g., number-average, weight-average, viscosity-average) would each be expected to give different numerical values for the same resin.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Lin in US Patent 5,955,235.

Lin discloses a toner having a binder resin, a wax, and a compatibilizer. The compatibilizer appears to be a random copolymer as specified in column 8, line 13 – column 9, line 48. The compatibilizer improves dispersion of the wax in the toner binder resin (col. 5, l. 41-59). Useful waxes include polyolefins (col. 10, l. 25). It appears that the units of the

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compatibilizer are respectively compatible with units of the binder resin and the wax as domains of the wax are present in the binder resin (Example 1; col. 16).

Claims 1-4, 7-10, 12, and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Crystal in US Patent 4,027,048.

Crystal discloses a toner containing two incompatible polymers. One polymer is a "tough" polymer that serves as a matrix. The other polymer is a soft polymer that is present as a plurality of discrete domains inside the matrix (col. 2, l. 15-42). This soft polymer provides desired fixing properties. The domain size of the matrix is preferably about 0.1 to about 2 microns (col. 4, l. 4-19). A compatibilizer (i.e., dispersing agent) is combined with the matrix polymer and domain polymer to improve dispersion of the domain in the matrix (col. 4, l. 34-63). One component of the compatibilizer is compatible with the matrix polymer and another component is compatible with the domain polymer. The reference specifically discloses a "shaded" copolymer as effective as a compatibilizer. This shaded copolymer is defined as being a random copolymer (col. 4, l. 48-55) and is used in an amount of from about 1 to about 50 weight % (col. 5, l. 3-6). The amount of the compatibilizer affects the domain size (col. 4, l. 64-68). The compatibilizer is disclosed as containing components corresponding to the matrix polymer and soft polymer (col. 4, l. 59-63).

Preferred matrix polymers include polystyrene, styrene copolymers, polymers of alkylmethacrylates, vinyl chloride polymers, polyamides, and polymers of acrylic or methacrylic acid (col. 3, l. 20-33). The glass transition temperature of the matrix polymer is greater than 50 °C, preferably about 55 °C to about 180 °C. The number-average molecular weight of the matrix polymer is preferably 5000 to about 300,000 (col. 2, l. 43-55). Preferred soft polymers include polyolefin waxes (col. 3, l. 68), which would be understood by the artisan to release agents.

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The glass transition temperature of the domain polymer is less than about 30 °C, preferably about -50 °C to about 10 °C. The number-average molecular weight of the matrix polymer is preferably 500 to about 50,000 (col. 3, l. 34-44).

The toner can be combined with a carrier to form a developer (col. 6, l. 61-65).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10, 12-18, and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crystal in US Patent 4,027,048 in view of Katada *et al.* in US Patent 5,972,553 and further in view of Sato *et al.* in US Patent 5,985,501.

Crystal was discussed above. In the event the disclosure is not specific enough to identically disclose the claimed toner composition in claims 1-4, 7-10, 12, and 22, this rejection is applied. Additionally, the reference does not identically disclose the claimed compatibilizer (dispersing agent) content or structural components of the compatibilizer (i.e., second resin), primary resin, and wax as specified in the instant dependent claims.

Katada discloses that waxes, such as polyolefins, are well known release agents. These components provide anti-offset character and low temperature fixing ability (col. 4, l. 35-38). Sato discloses release agents as low molecular weight polyolefins such as polyethylene and polypropylene (col. 7, l. 53-58).

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to use those use a polyolefin wax as the domain polymer in Crystal because this is a specifically disclosed domain polymer. It would also have been obvious to use the shaded (random) copolymer as the dispersing agent (i.e., compatibilizer) in Crystal because this is one of three structures disclosed for the dispersing agent. It would have been obvious optimize the amount of the dispersing agent to achieve nearly the same size of domains in the toners because Crystal teaches control of domain size via choice of dispersing agent amount. The artisan would expect similar size of domains in each toner particle because the amount of dispersion agent is constant throughout the composition.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use polyethylene or polypropylene as the polyolefin wax in Crystal because polyethylene and polypropylene are disclosed in Sato as known release agents and Katada discloses identifies polyolefins as effective waxes to provide low temperature fixing properties. The artisan would have been expected to use well known polyolefins for the low fixing temperature characteristics desired in Crystal for the soft polymer.

Given the disclosure of the specific matrix polymer constituents in Crystal (e.g., methacrylate, methacrylic acid) and the disclosure of useful polyolefin waxes in the supporting references, such as polyethylene, would have motivated the artisan to produce the dispersing agent from monomer units corresponding to each of the matrix polymer and polyolefin waxes.

Claims 11 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crystal in US Patent 4,027,048 in view of Katada *et al.* in US Patent 5,972,553 and further in view of Sato *et al.* in US Patent 5,985,501 as applied to claims 1-10, 12-18, and 20-22 above, and further in view of Mahabadi *et al.* in US Patent 5,364,724.

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Crystal, Katada, and Sato were described above. The references do not disclose olefin as a monomer for the matrix polymer, but Mahabadi discloses that typical vinyl monomers for a toner resin include unsaturated mono-olefins (col. 5, l. 49-51). The disclosure of polymers for the toner resin in Mahabadi overlaps substantially with the polymers disclosed in Crystal (see Mahabadi: col. 5, l. 36-68). These binder resins are used in toners where compatibility with a wax (e.g., polyethylene and polypropylene) is desired (col. 5, l. 6-10).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an unsaturated mono-olefin as one of the monomers for the matrix polymer in Crystal because Mahabadi discloses olefins as particularly effective and both references are concerned with using compatibilizers for waxes and binder resins. There is sufficient similarity between the disclosures of the references to indicate that the artisan would have a likelihood of success in making the proposed combination.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher D RoDee whose telephone number is 703 308-2465. The examiner can normally be reached on most weekdays from 6 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703 308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9310 for regular communications and 703 872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0661.

**CHRISTOPHER RODEE
PRIMARY EXAMINER**

cdr
June 10, 2002